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Feeding Brood Sows

Cooperative Extension South Dakota State University

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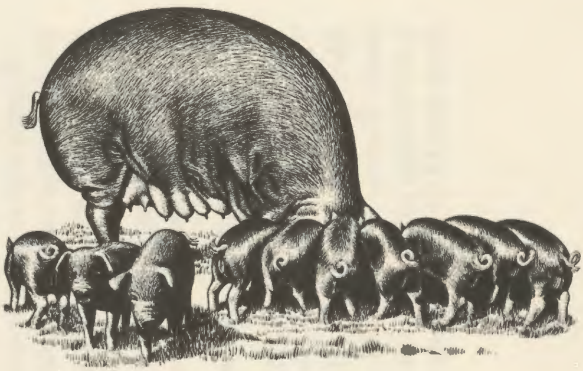

COOPERATIVE EXTENSION SERVICE
SOUTH DAKOTA STATE UNIVERSITY
U. S. DEPARTMENT OF AGRICULTURE

Feeding Brood Sows

Pregestation, gestation, and lactation are critical periods in swine nutrition.

Biggest losses generally occur during the gestation period. These prenatal losses can run 40% to 50% of the total eggs fertilized. Improper feed and lack of care given the brood sow are the main causes of trouble during conception, reproduction, and lactation.

A balanced ration is a combination of feeds furnishing the various nutrients in such proportion, amount and form as will, without waste, properly nourish a given animal or group of animals for a particular purpose.

In formulating swine breeding rations, always consider the nutrients supplied in available form by natural feedstuffs. Supplement swine rations only by the amounts of nutrients needed to balance the ration. No evidence exists that super-fortification of a ration above the nutrient requirement will bring about any additional benefits. In fact, in many instances, it may be harmful.

NUTRIENT REQUIREMENTS OF SOWS

Protein

Protein is needed for maintenance, growth, gestation, and lactation. The carcass of a new born pig on a dry matter basis is composed of 70% protein or nitrogenous materials. Therefore, proper protein level in the ration is of special importance for gestating-lactating sows.

In numerous experiments swine have been fed good quality proteins to determine the most desirable level of crude protein in complete rations fed in dry lot and of the concentrates fed on pasture. Recommended crude protein allowances for breeding stock are given in table 1.

Energy Allowances

Energy is needed to maintain necessary life processes. After these processes are supplied, surplus energy may be stored as fat.

Carbohydrates and fats of available feeds are the chief sources of heat and energy in swine rations. Protein rich feeds are seldom used for this purpose because of their relatively high cost. Carbohydrates, which make up 75% of the dry matter in most plants, are the most abundant nutrients in all common feeds and are especially abundant in cereal grains and their by-products.

Swine require fat in a ration, although the minimum level is not known. Research data indicates that a level of 1.0 to 1.5% fat is adequate. The practical swine ration contains at least this amount.

Swine are single-stomach animals rather than ruminants, and not considered roughage consuming animals. However, the brood sow can be fed some roughage. Levels of 15 to 25% fibrous feed, such as ground alfalfa hay or meal, are commonly used for bred sows and, if self-fed, you may want to consider higher levels. Recommended energy requirements are given in table 1.

Minerals

Mineral requirements for breeding swine favor the use of simple mineral mixtures. Providing excessive amounts of minerals when unnecessary is expensive and wasteful and may actually injure animals. Minerals considered most essential in swine breeding rations and therefore most apt to be deficient are given in table 1.

Minerals can be mixed with other feeds, fed free-choice, or both. When added to other feeds, mix so that minerals make up about 1¼ to 2% of the complete feed intake. Lactating sows have the highest daily mineral requirement.

The mineral mixture listed below is adequate under most South Dakota conditions. It is recommended that breeding swine have free access to the mixture in a self-feeder.

Limestone	40%
Steamed bone meal or Dicalcium phosphate	40%
Trace mineral salt	20%

Vitamins

Vitamins represent a class of chemical food compounds, separate from carbohydrates, fat, proteins, and minerals. Many appear to function in connection with certain tissues. Vitamin A, for example, is essential to the maintenance and normal functionings of the epithelia tissues. Also, several water-soluble vitamins are essential to formation of certain blood constituents.

Breeding animals produced under dry lot conditions may become vitamin deficient. Supplemental sources of vitamins A, D, and the B vitamins—riboflavin, niacin, pantothenic acid, and B_{12} are sometimes required.

Whether or not vitamin supplementation is needed will depend upon the quantity and quality of the ingredients in the ration. Using either green, high producing alfalfa pasture or 25-35% well-cured, green, leafy alfalfa hay will eliminate most vitamin deficiencies of breeding swine under practical farm conditions.

By **L. J. Kortan**, Extension livestock specialist,
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Table 1. Nutrient Requirements of Breeding Stock (Expressed in Percentage or Amount Per Pound of Total Ration)

	Bred		Breeding stock		Boars	
	Gilts	Sows	Gilts	Sows	Young	Adult
			Lactating			
Liveweight, lb.	300	500	350	450	300	500
Expected daily gain, lb.	1.0	0.7	------	------	1.0	------
Protein and energy:						
Crude protein, %	15	13	15	13	15	13
Total digestible nutrients, %	70	70	75	75	70	70
Digestible energy, Kcal*	1,400	1,400	1,500	1,500	1,400	1,400
Inorganic nutrients:						
Calcium, %	0.6	0.6	0.6	0.6	0.6	0.6
Phosphorus, %	0.4	0.4	0.4	0.4	0.4	0.4
Salt (NaCl), %	0.5	0.5	0.5	0.5	0.5	0.5
Vitamins:						
Carotene, mg.†	2.5	2.5	2.5	2.5	2.5	2.5
Vitamin A, I.U.†	1,333	1,333	1,333	1,333	1,333	1,333
Vitamin D, I.U.	60	60	60	60	60	60
Thiamine, mg.	0.5	0.5	0.5	0.5	0.5	0.5
Riboflavin, mg.	1.5	1.5	1.5	1.5	1.5	1.5
Niacin, mg.	5.0	5.0	5.0	5.0	5.0	5.0
Pantothenic acid, mg.	6.0	6.0	6.0	6.0	6.0	6.0
Vitamin B_{12}, mcg.	5.0	5.0	5.0	5.0	5.0	5.0

*Digestible energy was calculated on the assumption that one pound of TDN has 2,000 Kcal. of digestible energy.
†Carotene and vitamin A values based on 1 mg. carotene equals 533 I.U. vitamin A for the pig. Vitamin A requirements can be met by either carotene or vitamin A; both are not needed.

Antibiotics

No clear-cut evidence exists to explain the functioning of antibiotics. Most investigators think, however, that antibiotics act upon some system connected directly or indirectly with the microbial flora of the host animal.

Some evidence indicates that feeding antibiotics during breeding and at farrowing at levels of 10 to 15 mg./lb. of ration (20 to 30 grams/ton mixed feed) may increase the birth weight, livability, and weaning weight of pigs.

Water

Water is an often neglected, but important, nutrient required for gestating-lactating sows.

Daily water requirements for gestating sows is 4 to 5 gallons per day. Lactating sows require higher amounts—up to 6 gallons daily—as their milk is 80% water. A lactating sow will produce a maximum of 8 to 12 pounds milk daily during the first 3-4 weeks, then decline gradually.

HERD REPLACEMENT GILTS

Select and separate gilts from market hogs when they weigh 125-160 pounds. During the development period and prior to breeding, feed the gilts a limited ration (4 to 5.5 pounds) of 13 to 15% protein. They should weigh at least 250 pounds and have had at least one heat period at breeding.

Be sure you use a good pasture during the development period. If such pasture is unavailable and gilts must be under dry lot, feed alfalfa meal equaling at least 15%, by weight, of the total brood sow ration.

Flushing Before Breeding

Flushing means feeding sows or gilts so they gain at least 1 pound daily for 10 days prior to and 15 days after breeding. A full feed (6 to 7 pounds) of a normal 16% protein ration is satisfactory.

PASTURE-REPLACED FEED

Successfully feeding the brood sow in South Dakota often consists of making maximum use of pasture and feeding a generous quantity of high quality ground alfalfa hay when pastures are not available. Pasture or high quality ground alfalfa will increase the quantity and improve the quality of proteins, provide necessary vitamins, and improve the mineral content of the ration. Pasture also reduces feed costs, provides exercise area, and is an important part of a good sanitation program.

Gilts and, especially, mature sows make excellent use of green growing pasture. The condition (fatness) can be well controlled while considerable concentrate feed is saved by limited-feeding gilts on good-quality pasture. A feed saving of $50 to $70 per acre is possible. Sows in early pregnancy can be maintained largely on good pasture and minerals.

Indications are that pasture for sows will:

1. Increase litter size
2. Increase vigor of pigs at birth
3. Increase number of pigs weaned
4. Reduce breeding failures

An acre of good South Dakota alfalfa or clover pasture will provide a carrying capacity of 8 to 10 sows.

Table 2. Various Rations for Brood Sows

	Young growing gilts				Sows during gestation						High roughage gestation rations				Sow during lactation		
	Hand feeding	Self feeding	Limited Pasture or Dry Lot		Hand feeding Pasture	Dry lot	Dry lot	Self feeding Pasture or dry lot	Pasture or dry lot	Dry lot	Self feeding Corn cobs	Ear corn	Alfalfa	Corn silage supplement	Hand or self feeding		Bran ration
Ration number	1	2	2 A	2B	3	4	5	6	7	8	9	10	11	12	13	14	15
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Ground Corn	1100	600	1245	1448	-----	800	1000	650	900	600	860	-----	900	1065	800	1000	1400
Ground ear corn	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	700	-----	-----	-----	-----	-----
Grain sorghum, ground	-----	-----	-----	-----	1640	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Ground oats	500	700	200	-----	-----	600	400	650	300	690	-----	600	-----	-----	690	490	-----
Wheat bran	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	300
Ground alfalfa hay (meal 17%)	250	500	100	50	200	300	400	600	600	500	100	500	500	200	200	200	-----
Soybean oil meal	100	175	300	420	60	260	150	60	140	175	340	90	260	400	230	220	180
Meat & bone scraps	50	25	100	-----	-----	-----	50	40	60	25	100	100	40	300	70	80	110
Tankage (60%)	-----	-----	-----	-----	60	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Molasses	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	100	-----	100	-----	-----	-----	-----
Corn silage	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Ground corn cobs	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	500	-----	190	-----	-----	-----	-----
Dicalcium phosphate or bone meal	-----	10	30	60	20	30	-----	-----	-----	10	10	-----	10	15	10	10	-----
Limestone	8	-----	10	12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Trace mineral salt	10	10	15	10	10	10	10	10	10	10	10	10	10	20	10	10	10
Antibiotics	10 gms.	10 gms.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
B_{12} supplement	-----	-----	-----	-----	*	*	-----	-----	-----	-----	*	-----	-----	*	*	*	*
B complex vitamins	-----	-----	-----	-----	*	*	-----	-----	-----	-----	*	-----	-----	*	*	*	*
Vitamin A & D	-----	-----	-----	-----	*	*	-----	-----	-----	-----	*	-----	-----	*	*	*	*
Suggested amount to feed	**	-----	-----	-----	***	***	***	-----	-----	-----	-----	-----	-----	****	-----	-----	-----
Approximate crude protein, %	13.03	15.42	16.90	16.39	13.87	15.20	15.03	13.95	14.80	15.42	14.44	15.20	14.00	22.46	16.03	15.65	14.86
Approximate mineral, %																	
Ca	.64	.60	1.12	1.11	.62	.65	.65	.70	.83	.70	.62	.94	.74	1.89	.75	.80	.60
P	.42	.47	.83	.87	.59	.50	.45	.38	.44	.46	.48	.51	.53	1.16	.63	.62	.63

High quality lush pasture and legume hays generally carry generous amounts of necessary vitamins.

*When vitamins are added, the amounts shown below are the recommended levels to add to each pound or to each ton of complete ration.

B_{12} supplement .....5.0 mcg./lb. ration—10 mg./T.
B complex vitamins
Riboflavin .....1.5 mg./lb. ration—3 g./T.
Calcium pantothenate ....6.0 mg./lb. ration—12 g./T.
Niacin .....8.0 mg./lb. ration—16 g./T.
Vitamin A .....1500 I.U./lb. ration 3,000,000 I.U./T.
Vitamin D .....120 I.U./lb. ration 240,000 I.U./T.

**Feed 2 to 3 pounds for each 100 pounds of live weight after separation from finishing lot.

***Feed 1 to 2 pounds ration per 100 pounds live weight per sow.

****High quality silage—60 to 80 bushel corn yield—(should eat average of 6 to 8 pounds per day) and 3 pounds per gilt and 2 pounds per sow of this corn silage supplement up until last 5 weeks of pregnancy. From then on increase supplement 1 pound per day. If silage has low grain content feed added amount of grain to maintain proper condition of sows.

PASTURE ROTATION

Emergency Pasture

Emergency pasture will generally yield supplemental green feed. Such crops as rye, oats, and rape are suitable.

HAND FEEDING DURING GESTATION

Hand-feeding increases labor costs but generally reduces feed costs. Hand-feeding makes possible regulation of the pregnant sow's feed intake (limited feed). Usually a gain of 80 to 100 pounds for gilts and 40 to 60 pounds for sows is sufficient during the gestation period. A complete dry lot ration contains 14 to 16% protein with at least 10 to 15% ground alfalfa hay or meal (table 2).

Under most conditions, feed 6 pounds per day during flushing and up until 2 to 3 weeks after breeding. The remaining part of the first two-thirds of gestation period, 3 to 4 pounds per head will be ample. Increase the amount during the last one-third of pregnancy to 6 pounds.

Gilts and sows require 16 to 20 grams of calcium and 10 to 14 grams of phosphorus daily. Under a limited feeding program, when the intake is reduced to 3 or 4 pounds of complete ration daily, increase the calcium and phosphorus percentage per pound of total ration shown in table 1 to 1.00 to 1.25% calcium and 0.78 to 0.85% phosphorus. Rations 2A and 2B in Table 2 are recommended when following a limited feeding program.

If grain and supplements are hand-fed daily in dry lot, be sure the amount of supplement meets the sow's protein needs even though grain, the energy feed, is limited. Daily supplement requirements (a 35 to 40% crude protein supplement) under a hand feeding program is 1.3 pounds for gilts and 1.2 pounds for sows.

SELF-FEEDING DURING GESTATION

Self-feeding takes less labor but increases feed costs. To keep sows from getting too fat, rations need more fiber (generally ground alfalfa hay or meal) than usual. Provide 20 to 35% in a meal. When following a self-feeding program it is necessary to grind fibrous feeds fine (3/16 inch hammer mill screen) to prevent

sows from sorting. A ration with 12% protein content is needed under a self-feeding program.

FEED COST

Feed makes up about 70% of the cost of producing pork. Buildings, equipment, labor, interest, and miscellaneous costs make up the rest. Estimated cost of feed per sow and litter of eight pigs is estimated in table 3.

Table 3. Figuring the Cost of Feed Per Sow and Litter of Eight Pigs Under Confined Feeding, Using Concentrate Ration, and Hand-Feeding During Gestation

Gestation	
First 21 days using 6 pounds per day	126 lbs.
Next 70 days using 4 pounds per day	280 lbs.
Last 24 days using 6 pounds per day	144 lbs.
Total	550 lbs.
Lactation	
56 days using 10 pounds per day	350 lbs.
Total	900 lbs.
Creep Feeding	
25 lbs. per pig before weaning (8 pigs)	200 lbs.
Total Feed for Sow and pigs from breeding to weaning	1100 lbs.
Feed Costs	
Total feed costs (feed at 3.0¢ lb.):3.0x1100	$33.00
Total feed costs per pig (8 pig litter) $33.00÷8	$ 4.12

*Self-feeding sows during gestation will require 40 to 50% more feed during this period.

†Bred sows on excellent quality legume pasture will require about 1.5 pounds less grain per day than those in dry lot.

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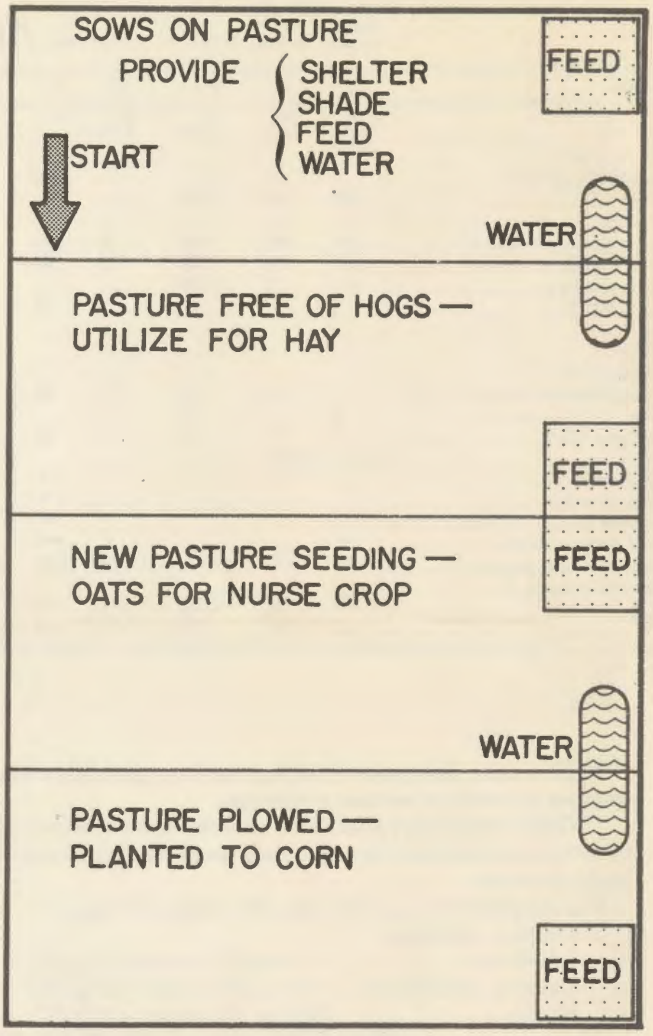

Four-Year Pasture Rotation with Alfalfa or Alfalfa Mixture. Each year in the pasture plan above:

Gilts and sows rotate to new pasture.

One pasture is kept free of hogs and may be utilized for hay crops.

One pasture is seeded to new pasture with oats as a nurse crop.

One pasture is plowed and planted to corn.

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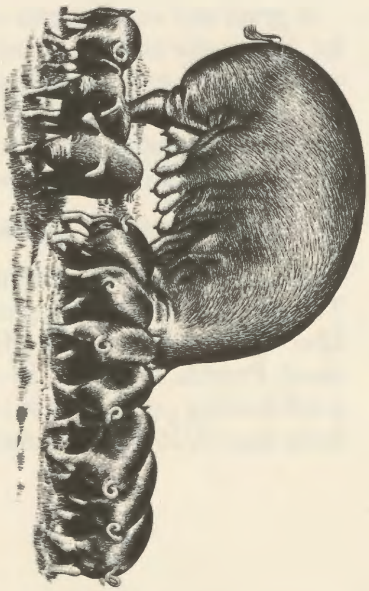

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